APPENDIX C

WETLANDS ASSESSMENT

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WETLANDS ASSESSMENT
PROPOSED CONVEYANCE OF PARCEL G
BY THE U.S. DEPARTMENT OF ENERGY
OAK RIDGE, TENNESSEE

Date Issued—February 2007

U.S. Department of Energy
Oak Ridge Office
Oak Ridge, Tennessee

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SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

contributed to the preparation of this document and should not be considered an eligible contractor for its review.

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ABBREVIATIONS AND ACRONYMS

AMSE	American Museum of Science and Energy
CFR	*Code of Federal Regulations*
CWA	Clean Water Act of 1972
DOE	U.S. Department of Energy
ORO	Oak Ridge Office
ORR	Oak Ridge Reservation
TDEC	Tennessee Department of Environment and Conservation
TVA	Tennessee Valley Authority
USACE	U.S. Army Corps of Engineers

1. INTRODUCTION

The U.S. Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Environmental Laboratory 1987). Wetlands usually include swamps, marshes, bogs, and similar areas. In identifying a wetland, three characteristics must be present. First is the dominance of hydrophytic vegetation (plants that have morphological or physiological adaptations to grow, compete, or persist in anaerobic soil conditions). Second, hydric soils are present and possess characteristics that are associated with reducing (anaerobic or low oxygen) soil conditions. Third, wetland hydrology must be present (i.e., the site must be flooded or saturated for sufficient duration during the growing season to create anaerobic conditions at the site (Environmental Laboratory 1987).

This wetlands assessment has been prepared in accordance with the *Code of Federal Regulations* (*CFR*) Title 10 Part 1022, for the purpose of fulfilling the U.S. Department of Energy's (DOE's) responsibilities under Executive Order 11990, "Wetlands Protection." The order encourages federal agencies to implement measures to preserve and enhance the natural and beneficial functions of wetlands. The order also requires federal agencies to take action to minimize or mitigate the destruction, loss, and degradation of wetlands. The sequence of mitigation measures should emphasize the following:

- avoiding actions in wetlands, including new construction or work, unless there is no practicable alternative to that action; and

- minimizing harm should the only practicable alternative require that any particular action take place in a wetland.

The executive order applies to activities in furtherance of DOE responsibilities for acquiring, managing, and disposing of federal lands and facilities. When property in a wetland is proposed for lease, easement, right-of-way, or disposal to non-federal public or private parties, DOE shall (1) identify those uses that are restricted under federal, state, or local wetlands regulations; (2) attach other appropriate restrictions to uses of the property; or (3) withhold the property from conveyance.

Finally, the executive order seeks to provide early and adequate opportunities for public review of plans and proposals involving new construction or similar projects in wetlands.

This wetlands assessment serves to inform the public of proposed activities at the Oak Ridge Reservation (ORR) that have the potential to affect wetlands on property currently controlled by DOE and to present measures or alternatives to the proposed action that will reduce or mitigate adverse effects to these wetlands. Information is presented on the following topics: project description, site description, effects on wetlands, alternatives, and mitigation.

2. PROJECT DESCRIPTION

2.1 PROPOSED ACTION

This wetlands assessment evaluates the potential impacts to wetlands from the proposed conveyance of Parcel G. Parcel G is one of three parcels being considered for conveyance from DOE to the American Museum of Science and Energy Foundation, city of Oak Ridge, or other managing entity. The other two

parcels are the American Museum of Science and Energy (AMSE) and associated property and Parcel 279.01, neither of which contain wetlands. The potential environmental impacts of the proposed action were considered in an environmental assessment prepared by DOE (DOE 2007). The purpose of the proposed DOE action is to provide a plan for the long-term financial stability of the AMSE to preserve the museum as an asset to the city of Oak Ridge and the surrounding region. The proposed conveyance of the three parcels is also intended to help offset the long-term cost of operating the museum. The purpose of the proposed action is also to convey underutilized DOE-Oak Ridge Office (ORO) real property for economic development to help offset potential economic losses resulting from DOE downsizing, facility closeouts, and work force restructuring.

Because specific uses of Parcel G would not be known prior to the conveyance, DOE has developed reasonably foreseeable scenarios and uses to bound the impacts analysis. Scenarios identify potential tenants; utilities and infrastructure; areas to be excluded from development; and a range of emissions, effluents, and wastes that could result from commercial and industrial activities. It is anticipated that the city of Oak Ridge would develop portions of Parcel G for small-scale offices, light industrial use, or retail businesses.

2.2 PROJECT LOCATION

Parcel G contains about 21 acres and is located southeast of the intersection of Bethel Valley and Scarboro roads (Fig. 1). A portion of Parcel G is within the area of the Oak Ridge Institute of Science and Energy Scarboro Operations Site (formerly the South Campus Facility). The Scarboro Operations Site supported research on the biological effects of radionuclides on animals. The portion of Parcel G that is within the boundary of the Scarboro Operations Site was an area where only unexposed animals were housed or grazed. In addition to pasture, the area contained various barns and a three-tiered swine waste treatment pond system. Only one barn structure remains within Parcel G. Nearby land uses include the Y-12 Security Complex buffer area, Bethel Valley Industrial Park, Commerce Park, and the University of Tennessee Forest Experiment Station and Arboretum. Parcel G is currently zoned by the city of Oak Ridge as FIR (Federal Industry and Research).

2.3 WETLANDS AT PARCEL G

Parcel G and the adjacent DOE property to the south support a palustrine emergent/scrub-shrub wetland system along Scarboro Creek totaling approximately 3.4 acres (Rosensteel 1993). The portion of this wetland system that is located within the boundary of Parcel G is about 1.0 acre. All wetlands identified at Parcel G exhibited positive field indicators of the wetland criteria: hydrophytic plants, hydric soils, and wetland hydrology. The majority of these wetlands are associated with the floodplain of Scarboro Creek, the Scarboro Creek embayment (part of Melton Hill Reservoir), and two beaver ponds in Scarboro Creek immediately south of Parcel G (Fig. 2).

In addition to the Scarboro Creek wetlands, there are three ponds that were created to treat swine waste when Parcel G was actively associated with operation of the Scarboro Operations Site. Agricultural use of the ponds ceased in the mid-1980s and all three ponds have remained at the site. Two of the ponds remain permanently inundated. The third pond only holds water for relatively short periods and supports a wetland plant community.

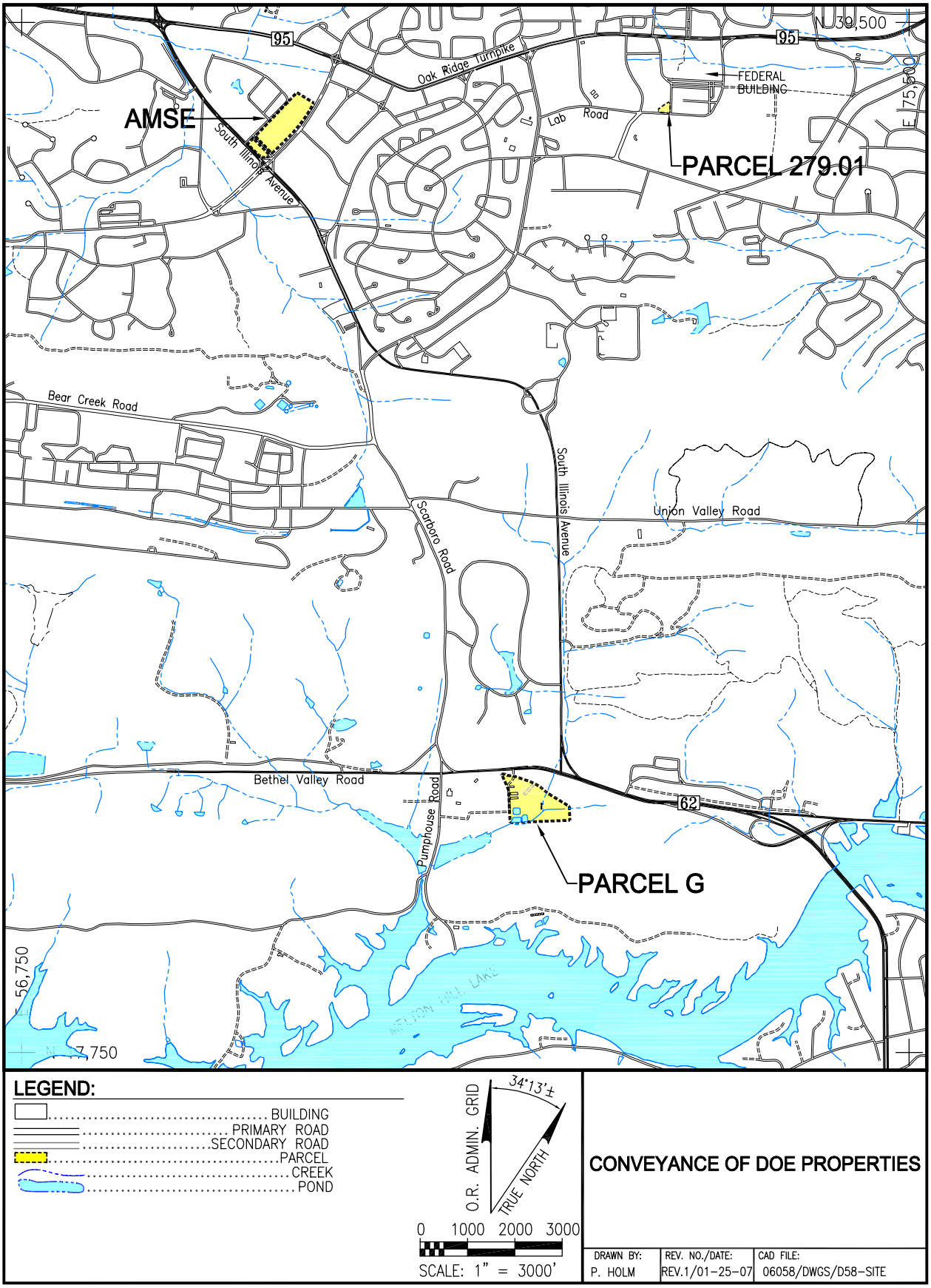

Fig. 1. Vicinity map for Parcel G.

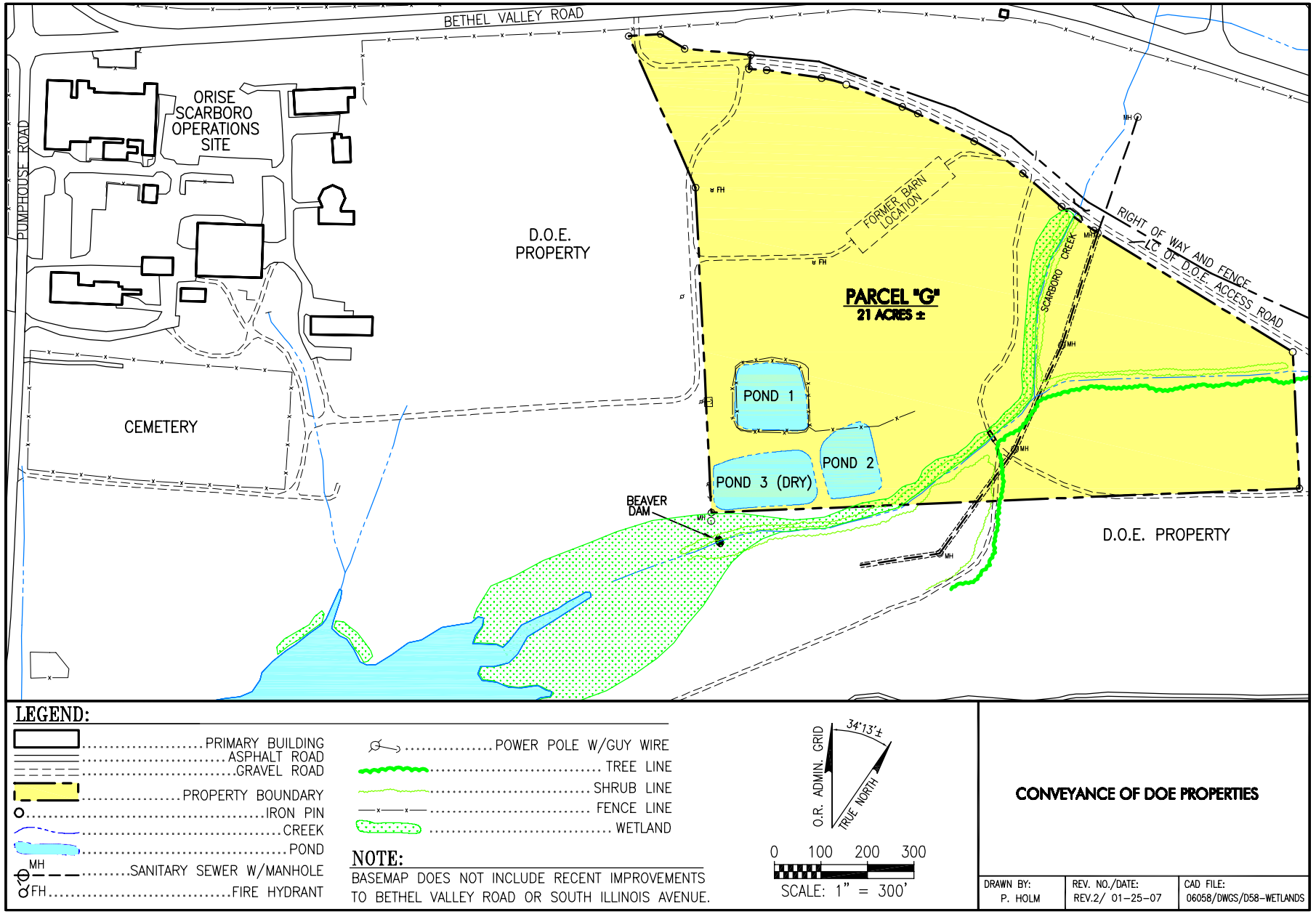

Fig. 2. Wetlands at Parcel G.

2.3.1 Scarboro Creek Wetlands

Wetlands at Parcel G are located in the floodplain along Scarboro Creek. These wetlands include a mix of persistent and nonpersistent emergent plants and woody plants. Dominant plants include black willow (*Salix nigra*), fowl manna grass (*Glyceria striata*), cattails (*Typha* sp.), softstem bulrush (*Schoenoplectus validus*), soft rush (*Juncus effusus*), curly dock (*Rumex crispus*), horsetail (*Equisetum* sp.), spotted jewelweed (*Impatiens capensis*), hog peanut (*Amphicarpaea bracteata*), Joe-Pye-weed (*Eupatoriadelphus* sp.), and peppermint (*Mentha* X *piperita*).

Indicators of wetland hydrology include saturated soils in the upper 12-in, drift lines, drainage patterns in wetlands, and oxidized root channels with live roots in the upper 12 in. The primary source of wetland hydrology is overbank flooding from Scarboro Creek and a seasonally high water table. Secondary sources of water are abundant groundwater seeps adjacent to the floodplain and seepage from the old swine waste ponds. Soils in the riparian wetlands consist of sandy loams, silt loams, and clay loams. Indicators of wetland soils included soil matrix colors with low chroma colors (1 or 2), mottles with higher chromas, and manganese concretions.

2.3.2 Swine Waste Ponds

Two of the swine waste ponds (Ponds 1 and 2, 0.47 acre and 0.38 acre, respectively) are permanently inundated and support little if any wetland vegetation. They would possibly be subject to regulation as waters of the state but they are not wetlands. Pond 3 (0.56 acre) only holds water seasonally and a wetland community consisting of persistent and nonpersistent emergent and woody wetland plants has colonized the site. Dominant vegetation includes scattered black willow saplings, some unidentified sedges (*Carex* sp.), woolgrass (*Scirpus cyperinus*), soft rush, and smartweed (*Polygonum* sp.). Indicators of wetland hydrology include periodic prolonged inundation and saturated soils in the upper 12 in. The primary source of wetland hydrology is probably direct precipitation and surface runoff. Secondary sources of water are probably seepage from the other two swine waste ponds. The ponds have no direct connection to Scarboro Creek (DOE 2002).The soils at the Pond 3 wetland were not examined intrusively.

2.3.3 Scarboro Creek Embayment Wetlands

Wetlands around the Scarboro embayment include emergent and wet meadow wetlands. Dominant species include various herbaceous species with a mix of woody plants. Emergent wetlands occur in areas that are saturated or inundated most of the year. Dominant plants include softstem bulrush, soft rush, and fowl manna grass. Indicators of wetland hydrology include inundation and saturation in the upper 12 in of soil. The primary source of wetland hydrology is a high water table resulting from lake levels, Melton Hill Reservoir, and recent beaver activity. Hydrology in these wetlands has been altered by beavers. There are several beaver dams on Scarboro Creek between Parcel G and the lake. Secondary sources of water are occasional overbank flooding of Scarboro Creek and groundwater seeps in the floodplain. Soils in the wetlands consist of gray (10 YR 5/1) and light grayish brown (10 YR 5/2) silt loams and clay loams with reddish mottles, manganese nodules, and oxidized root channels.

Wet meadow wetlands around Scarboro Creek embayment are dominated by nonpersistent emergent plants and scattered woody plants. Dominant herbaceous plant species are several unidentified grasses [most likely fescue (*Festuca arundinacea*) and redtop (*Agrostis alba*)] that have invaded from adjacent fields, hog peanut, Joe-Pye-weed, soft rush, peppermint, monkeyflower (*Mimulus ringens*), bugleweed (Lycopus americanus), jewelweed, and several unidentified sedges, including fox sedge (*Carex vulpinoidea*). Woody species include black willow, green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), alder (*Alnus serrulata*), and Japanese honeysuckle (*Lonicera japonica*).

Hydrology in the wet meadows is tied closely to water levels in the Scarboro embayment and supplemented by occasional inundation from stormwater runoff. Soils in the wetlands consist of gray (10 YR 5/1) and light grayish brown (10 YR 5/2) silt loams and clay loams with reddish mottles, manganese nodules, and oxidized root channels.

2.4 WETLAND FUNCTIONS AND CLASSIFICATION

Wetlands perform many biological, chemical, hydrological, and physical functions generally recognized as being valuable to society (Adamus et al. 1991, Brinson 1993). Some commonly recognized wetland functions include groundwater discharge, floodflow alteration (flood storage), sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, aquatic diversity, and wildlife diversity. Not all wetlands perform all functions, and not all wetlands perform the same function equally well. The ability of wetlands to perform various functions depends on the characteristics of the wetland and the magnitude of the inputs.

The wetlands at Parcel G perform various biological, chemical, hydrological, and physical functions. In the past, these wetlands have been heavily impacted by past disturbance at the site. Most of this disturbance occurred 20 or more years ago while the site was associated with the Scarboro Operations Site. After much of the early research at the Scarboro Operations Site ceased, the natural functions of the wetlands and Scarboro Creek began to recover and to improve. However, some disturbances have been more recent. After almost two decades of recovery, the recent realignment of South Illinois Avenue and Bethel Valley Road caused a great deal of new disturbance to Scarboro Creek and its wetlands. Following completion of the road construction, the creek and wetlands once again have begun to stabilize and a new period of recovery from the recent disturbance has started.

3. WETLANDS EFFECTS

3.1 POTENTIAL EFFECTS ON WETLANDS

The proposed conveyance of Parcel G would not inherently cause impacts that affect the survival, quality, natural, and beneficial values of wetlands at the site, because the proposed conveyance is an administrative action. The potential for, and degree of, adverse impacts would depend upon how Parcel G was developed. Activities associated with subsequent development of Parcel G could have beneficial effects or adverse effects on wetlands. Effects on wetlands may result from activities occurring directly in wetlands or effects may result indirectly from activities that occur in areas adjacent to wetlands. The consequences of wetland alteration may last for decades (long-term effects) or they may be minor enough that wetlands could recover in a few years (short-term effects).

Any activity that has the potential to affect wetlands in any way would be subject to regulation by the federal and/or state government. The entity that develops Parcel G would be required to comply with applicable federal, state, and local laws, rules, or ordinances governing land use in wetlands and streams. It would be the responsibility of that entity to secure all necessary permits and to comply with all permit requirements, including compensatory mitigation. This language would be incorporated into the DOE real estate instrument.

3.1.1 Positive Effects

Beneficial impacts include any actions that would improve the quality of wetlands or actions that enhanced the ability of wetlands to perform wetland functions. Examples of beneficial actions include

restoring or enhancing wetland hydrology to increase the hydroperiod in wetlands, planting additional species of wetland plants to increase diversity or structure, and controlling or eradicating exotic, invasive plants in wetlands. These types of activities may or may not occur as a result of implementing either the proposed action or the no action alternative.

3.1.2 Negative Effects

Negative impacts include any activity that adversely affects the survival, quality, natural, and beneficial values of wetlands. Negative effects would result from any action that eliminates or interferes with wetlands at Parcel G or reduces their ability to perform their normal biological, chemical, hydrological, and physical functions. Some or all of the wetlands could potentially experience negative impacts caused by future development of Parcel G. Any activities that would occur within wetlands and that could cause adverse effects to normal wetland functions would require prior authorization from regulatory agencies.

3.1.3 Direct Effects

Direct effects would result from any activity that occurs directly in a wetland and affects wetland characteristics or functions. Direct effects may be negative or adverse if they eliminate, interfere with, or reduce normal wetland functions. The most extreme example of direct adverse effects to wetlands would involve filling wetlands during site preparation or construction activities or draining wetlands by installing culverts or ditches to remove water. Direct effects may be positive if they restore or improve existing wetland functions. Examples of positive direct effects on wetlands would include any of the restoration activities described in Sect. 3.1.1.

3.1.4 Indirect Effects

Indirect impacts could result from tenant activities in areas adjacent to wetlands that interfere with wetland functions. Examples of indirect adverse impacts include siltation from soil erosion at nearby construction sites, spills or leaks of oil or other chemicals from construction equipment, overuse of pesticides or herbicides, and allowing invasive, exotic plant pest species to colonize wetlands, thereby diminishing the diversity and quality of wetland habitat. Examples of indirect positive impacts include controlling soil erosion, controlling or preventing spills or leaks of oil or other chemicals from construction equipment, using pesticides or herbicides safely to prevent contamination and mortality to wetland plants or animals, and controlling or eradicating invasive, exotic plant pest species to protect diversity and habitat quality.

3.1.5 Long-Term Effects

Long-term effects include any activities that influence wetland functions for several years or decades. Adverse long-term effects would include any activities (e.g., draining or filling) that damage wetland functions such that it would take several years or decades for wetland functions to recover to their pre-disturbance level. Adverse long-term effects are of sufficient magnitude and intensity that site resources may not recover without intervention (restoration). Long-term positive effects would include activities that provided permanent protection or stewardship of wetland functions or habitat.

3.1.6 Short-Term Effects

Short-term effects include any activities that have relatively minor impacts on wetland functions. An example of a short-term negative effect would be removal of woody vegetation from a wetland. Cutting back woody plants in a wetland would temporarily affect structure, but sprouts from cut stems would reestablish structure in a year or two. The recovery period for adverse short-term effects may take several weeks or months to a few years. Short-term disturbances are generally not severe enough to cause

permanent impairment of wetland functions and values. Site resources can usually recover in a short period of time without assistance. The duration of the recovery period depends on the magnitude of disturbance. Positive short-term effects include any activities that may have a temporary influence in wetlands. An example of a positive short-term effect could be one-time removal of invasive, exotic vegetation from a wetland without considering follow-up treatments to control resprouting or new seedlings from seed germination.

4. ALTERNATIVES

4.1 THE NO ACTION ALTERNATIVE

Under the no action alternative, Parcel G would not be conveyed and would remain as part of the ORR. Ongoing, routine maintenance and mowing activities, and current activities associated with the adjacent Scarboro Operations Site would continue. These uses would continue until another proposal for use of Parcel G was considered. No additional impacts to the wetlands at Parcel G would occur and it is expected that the wetland system associated with Scarboro Creek on Parcel G would continue to exist and function as it presently does.

4.2 MITIGATION

Any actions that take place in wetlands and other special aquatic sites at Parcel G are subject to regulation by USACE, the Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control, and possibly the Tennessee Valley Authority (TVA). USACE regulates activities in wetlands and other special aquatic sites through Sect. 404 of the Clean Water Act of 1972 (CWA). The state of Tennessee also regulates activities in wetlands under Sect. 401 of the CWA and the Tennessee Water Quality Control Act of 1977 (Tennessee Administrative Code 69-3-108). TVA regulates all construction, operation, or maintenance of structures affecting navigation, flood control, or public lands or reservations in the Tennessee River or its tributaries under Sect. 26a of the TVA Act (U.S. Congress, 1933, as amended). Anyone who wishes to discharge dredged or fill material into the waters of the United States, regardless of whether on private or public property, must obtain a Sect. 404 permit from the USACE and a Sect. 401 Water Quality Certification from the state prior to taking the action. In cases where TVA lands or waters may be affected, TVA and USACE would determine which agency would be the lead regulatory agency. State and federal storm water regulations to minimize erosion and sedimentation would also need to be met.

In general, TDEC has lower thresholds for disturbance to wetlands and other waters of the state than USACE. In some cases, USACE may determine that it does not have jurisdiction over activities that would affect certain types of wetlands. In these situations, TDEC would serve as the lead regulatory agency. The sequencing for regulatory review by USACE and TDEC and/or TVA requires applicants to make all efforts to avoid adverse impacts to wetlands if possible, minimize adverse impacts, and compensate for adverse impacts after making all practicable effort to avoid and minimize them. Compensatory requirements depend on the quality of the affected wetlands, the type and degree of impact, and the region of the state where the impact would occur. Compensation mitigation usually includes restoring, enhancing, or preserving wetlands. Compensatory requirements generally must be negotiated with USACE, TVA, and TDEC on a case-by-case basis.

4.2.1 Avoidance

Avoidance means that DOE would take steps to prevent new owners from engaging in any activity that would have adverse impacts on wetlands at Parcel G. The simplest way to achieve avoidance is through administrative controls such as conservation easements or other real estate instruments that preclude access to wetlands. This can be accomplished by (1) withholding wetlands from conveyance (some or all); (2) prohibiting development in wetlands (some or all); (3) mitigation specifically in the form of minimum grading requirements, runoff controls, and protection of ecologically sensitive areas; and (4) other restrictions on future uses of any transferred property. For administrative controls to be effective, wetland boundaries should be surveyed and marked in the field prior to transfer; appropriate restrictions would be placed in deeds, maps, and plats; appropriate buffer zones would be defined and required; and tenants could be prohibited from construction activities that have adverse direct or indirect effects on wetlands. Periodic inspections or monitoring may be required to ensure that all administrative controls are implemented and functioning as intended.

4.2.2 Minimization

Minimization means restricting actions that would adversely affect wetlands to the absolute minimum required for the project to continue. Minimization could include reducing areas of impact in wetlands and implementing best management practices and sediment controls that reduced or prevented soil erosion and runoff from construction sites; use of buffer zones around wetlands; and minimum grading requirements that reduced land disturbance on steep slopes adjacent to wetlands and streams.

4.2.3 Compensation

Compensation may be used as a mitigative measure when no practicable alternative exists to avoid or minimize disturbance in wetlands. Compensation may require creation of new wetlands, restoration of drained wetlands, preservation of unique wetlands, or enhancement of degraded wetlands. Most regulatory agencies prefer that compensatory mitigation occur in the same watershed as the permitted action. However, specific requirements for compensatory mitigation are subject to negotiation.

Current USACE and TDEC policy favors restoration, because restoration projects are generally more successful than creation, and enhancement or preservation only affect existing wetlands. In some cases, preservation or enhancement may be used with approval of the regulatory agency. Wetland creation is usually the least desirable form of compensation because of limited success rates. Wetland mitigation banks offer developers another option for wetland mitigation. Developers may purchase credits in large-scale restoration projects, thus allowing them the opportunity to accomplish their mitigation goals without having to worry about post-mitigation monitoring.

4.2.4 Regulatory Permits

All proposed activities on parcels proposed for transfer that would affect wetlands or other waters of the United States or state of Tennessee would be subject to compliance with all applicable local, state, and federal regulations. It would be the responsibility of the new owner to secure all applicable permits prior to initiating work in any wetlands. Permit conditions would stipulate which activities could occur in or around wetlands on transferred parcels. Regulatory permits would also specify all required mitigative measures, including compensation.

5. SUMMARY AND CONCLUSIONS

DOE proposes to convey approximately 21 acres of Parcel G to the American Museum of Science and Energy Foundation, city of Oak Ridge, or other managing entity. Following the conveyance, it is anticipated that portions of Parcel G would be developed for light industrial and/or other commercial purposes.

There is a 3.4-acre wetland system along Scarboro Creek on Parcel G and adjacent property to be retained by DOE. The actual area of wetlands to be conveyed with Parcel G is about 1.0 acre. DOE would retain control over the remaining 2.4 acres of wetlands along Scarboro Creek downstream from Parcel G. The 1.4 acres of ponds on Parcel G could be subject to federal and/or state jurisdiction. Coordination with USACE and TDEC would likely be required to make a final jurisdictional determination.

The proposed conveyance of Parcel G would not inherently cause adverse impacts that affected the survival, quality, natural, and beneficial values of wetlands along Scarboro Creek, because the proposed transfer is an administrative action. Rather, the potential for, and degree of, adverse impacts would depend upon how the property was developed. Adverse impacts would include any activity that eliminated or reduced the ability of wetlands to perform their normal biological, chemical, hydrological, and physical functions. Some or all of the wetlands associated with Scarboro Creek could potentially experience direct impacts by development in the wetlands themselves or indirect impacts from other activities associated with development of adjacent upland areas at Parcel G. Wetlands downstream from Parcel G could also be affected by any construction activities on Parcel G.

A number of administrative controls, including deed restrictions or conservation easements are available for DOE to use to prevent adverse impacts to wetlands at Parcel G. Proposals for development of Parcel G that would affect wetlands and other special aquatic resources would also be subject to regulation by USACE, TDEC, and possibly TVA. Proposed projects would be required to follow normal sequencing during regulatory review to avoid and minimize adverse impacts to wetlands at Parcel G. Compensatory mitigation should be used as a last resort and would be subject to negotiation between USACE, TDEC, and possibly DOE and TVA.

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